Minnesota Pollution Control Agency

CERTIFIED LETTER
RETURN RECEIPT REQUESTED

JUN 7 1995

City Manager
City of St. Louis Park
5065 Minnetonka Boulevard
St. Louis Park, Minnesota 55416

President
Reilly Industries
1510 Market Square Center
151 North Delaware Street
Indianapolis, Indiana 46204

RE: United States of America, et al. vs. Reilly Tar & Chemical Corporation, et al.
File No. CIV 4-80-469, Consent Decree - Remedial Action Plan
Section 7.4.1., Praire Du Chein-Jordon Aquifer Contingent Actions

Dear Gentlemen:

The U.S. Environmental Protection Agency (EPA)and the Minnesota Pollution Control Agency (MPCA) have reviewed monitoring and modeling data pertinent to the operation of the Prairie Du Chein-Jordon Aquifer's (OPJC's)gradient control system. According to the Consent Decree-Response Action Plan (CD-RAP) the gradient control system consists of the following three wells SLP4, SLP6, and W48. The gradient control system is designed to prevent the spread of contaminated ground water to neighboring community's water supplies.

The EPA and the MPCA have completed a series of modeling runs using the Single Layer Analytical Element Models (SLAEMS) with the objective of evaluating the gradient control system as it is presently implemented in the OPJC. The development of this model has followed the modeling work done by the United States Geological Survey (USGS) under contract to the MPCA in order to design the gradient control system in the early 1980's. The model was calibrated to 1880 era pre-pumping water levels as well as 1980 water levels, which represent a period of considerable pumping stress. These calibrations use the same aquifer properties, pumping rates, and water levels as the USGS model calibration. The agreement between the SLAEM and the USGS model is very good, with water levels generally within 10 feet of measured levels, and accuracy at least as good as the USGS model. The SLAEMS differs from the MODFLO™ used by the USGS in that MODFLO™ is a finite difference model that uses boundaries to simulate far-field conditions and a grid system to discretize aquifer domains. Following calibration of the model, files were set up to simulate several gradient control pumping scenarios during the spring and summer pumping seasons. The spring season simulation uses average pumping rates for the months of October through March. This represents the time of the year when pumping rates are lowest. The summer season simulation uses April through September pumping rates and represents the heavy pumping season.

Gradient control simulations utilize the same aquifer properties as the calibrated model and 1992 pumping rates of 90 high capacity wells that utilize the OPCJ. Pumping rates for these wells were obtained from the database maintained by the Department of Natural Resources Division of Waters. Simulations were conducted at CD-RAP designated pumping rates, present pumping rates, and other possible pumping rates. The gradient controls were plotted using the particle tracking function of the SLAEMS program, allowing for delineation of capture zones of gradient control wells. The capture zone plots are attached and are discussed below:

Figures 1, 2, and 3 are spring pumping season gradient control simulations. Figures 4 through 8 are summer season simulations.

Figure 1 shows capture zones for winter season pumping rates specified in the CD-RAP for wells SLP 4 and W48 and actual 1992 pumping rates for other wells. The combined capture zone for SLP 4, SLP 6 and SLP 10 & 15 appears to be effective in controlling the flow of contaminated ground water from the site with the possible exception of a narrow volume directly down gradient from W 23. It is impossible to say, within the limitations of the model, whether this small volume of contaminated ground water is actually being captured or not; unfortunately this volume of contaminated ground water contains some of the most highly contaminated ground water in the OPCJ in the vicinity of the site.

Figure 2 shows capture zones for SLP 4 pumping at 900 gpm, SLP 6 off-line, and W48 off-line. A large volume of contaminated ground water in the OPCJ can be seen escaping the site under this pumping scenario.

Figure 3 shows the projected capture zone with SLP 4 only pumping at 1200 gpm. It appears that a significant volume of contaminated ground water is leaving the site under this scenario.

Figure 4 shows capture zones for SLP 4 pumping at the CD-RAP specified rate and SLP 6 and W 48 pumping at 1980 rates. These were the rates used in the original design of the gradient control well system. This combination of pumping wells appears to be capable of controlling the area of contamination in the OPCJ within the limitations of accuracy of the model.

Figure 5 shows capture zones under the same rates as Figure 4 except that W 48 is not pumping. The capture zone for the southern portion of the area of contamination is considerable diminished here without W 48 in operation. It appears that a considerable volume of contaminated ground water is leaving the area of the site.

Figure 6 shows capture zones with SLP 4 only in operation. This pumping scenario is clearly not acceptable as nearly the entire southwestern of the area of contamination is not under hydraulic control.

Figure 7 shows capture zones with SLP 4 only pumping at a rate of 1200 gpm. While the capture zone is larger than shown in Figure 6, a significant of contaminated ground water appears to be leaving the site.

Figure 8 shows capture zones with SLP 4 pumping at 1200 gpm and SLP 6 at 690 gpm. This scenario appears to be nearly effective in providing hydraulic control over the area of contamination, with the possible exception of the extreme southwestern portion of the contaminated area and the same small volume directly downgradient of W 23 which appears in most of the simulations.

Conclusions:

1. SLP 6 alone, pumping at either 900 or 1200 gpm is unacceptable in providing gradient control over contaminated ground water in the vicinity of the site during either the spring or summer pumping seasons.

2. SLP 4 pumping at 900 gpm and SLP 6 pumping at 690 gpm appears to be marginally effective in providing necessary gradient control during the spring pumping season.

3. SLP 4 pumping at 1200 gpm in combination with SLP 6 pumping at 690 gpm appears to be marginally ineffective in providing hydraulic control at the site.

4. If SLP 6 is used for gradient control, it will pull the plume toward it and will likely exceed the drinking water criteria within a year or two. W 48 is better situated for gradient control as it is closer to the site. Pumping W 48 will not expand the size of the plume or pull it closer to the Edina well field.

The EPA and the MPCA hereby, notify pursuant to Section 7.4.1. of the CD that Reilly Tar & Chemical Corporation must submit a plan for gradient control system modification in order to prevent the spread of ground water exceeding any of the Drinking Water Criteria defined in Section 2.2. Water level data submitted in the Annual Monitoring Reports and well pumping data received from the Minnesota Department of Natural Resources indicate that the current gradient control system is not sufficient to prevent the spread of contaminated ground water. The required plan may include alteration of specified pumping at gradient control wells, additional gradient control wells or returning to service former gradient control wells. Within 90 days of receipt of this letter Reilly shall submit to the Agencies the gradient control system modification plan. The EPA and the MPCA shall review the plan in accordance with Part G of the Consent Decree.

Please call either Project Manager if you have concerns or questions on this letter.

Sincerely,

Douglas Beckwith
Project Manager
(612) 296-7715
Superfund Unit
Site Response Section
Ground Water and Solid Waste Division
Minnesota Pollution Control Agency

Darryl Owens
Remedial Project Manager
(312) 886-7089
Remedial Enforcement
Response Branch
U.S. Environmental Protection Agency

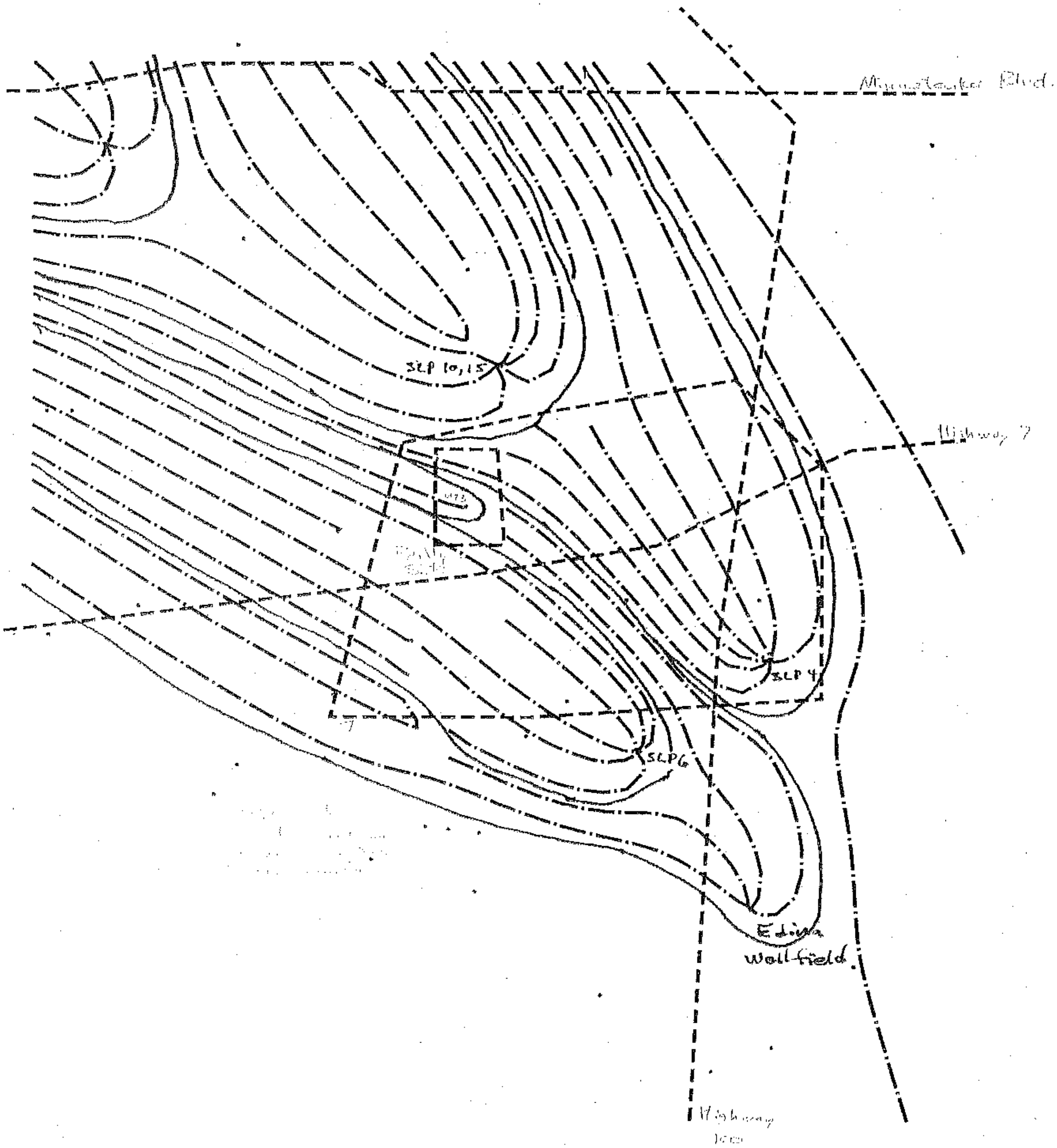
DB:DO:jlm

Enclosure

Figure 1

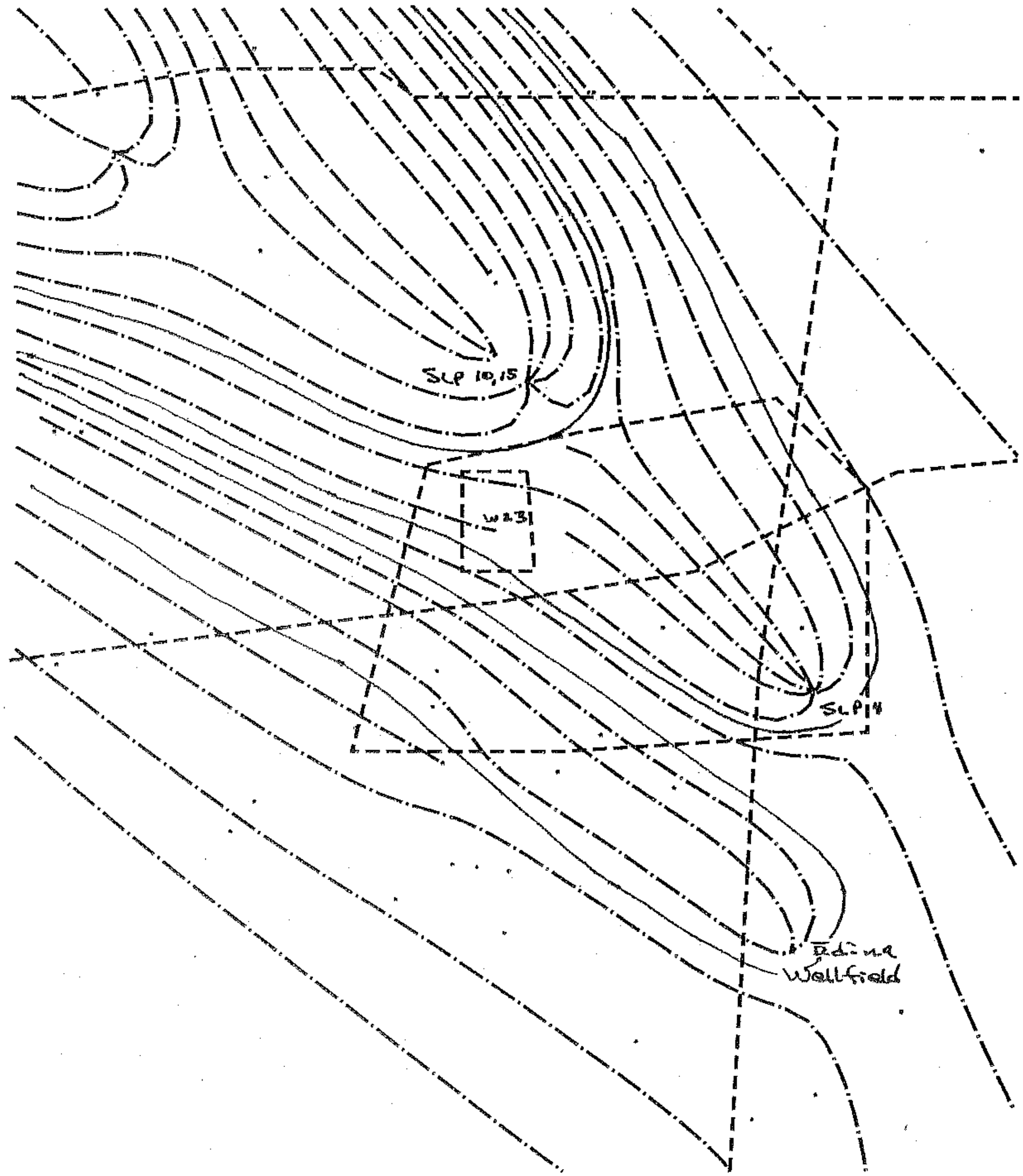
Spring 1992
pumping rates

SLP 4	900	gpm
SLP 6	690	gpm
W48	0	gpm



PU92 SP96, POS

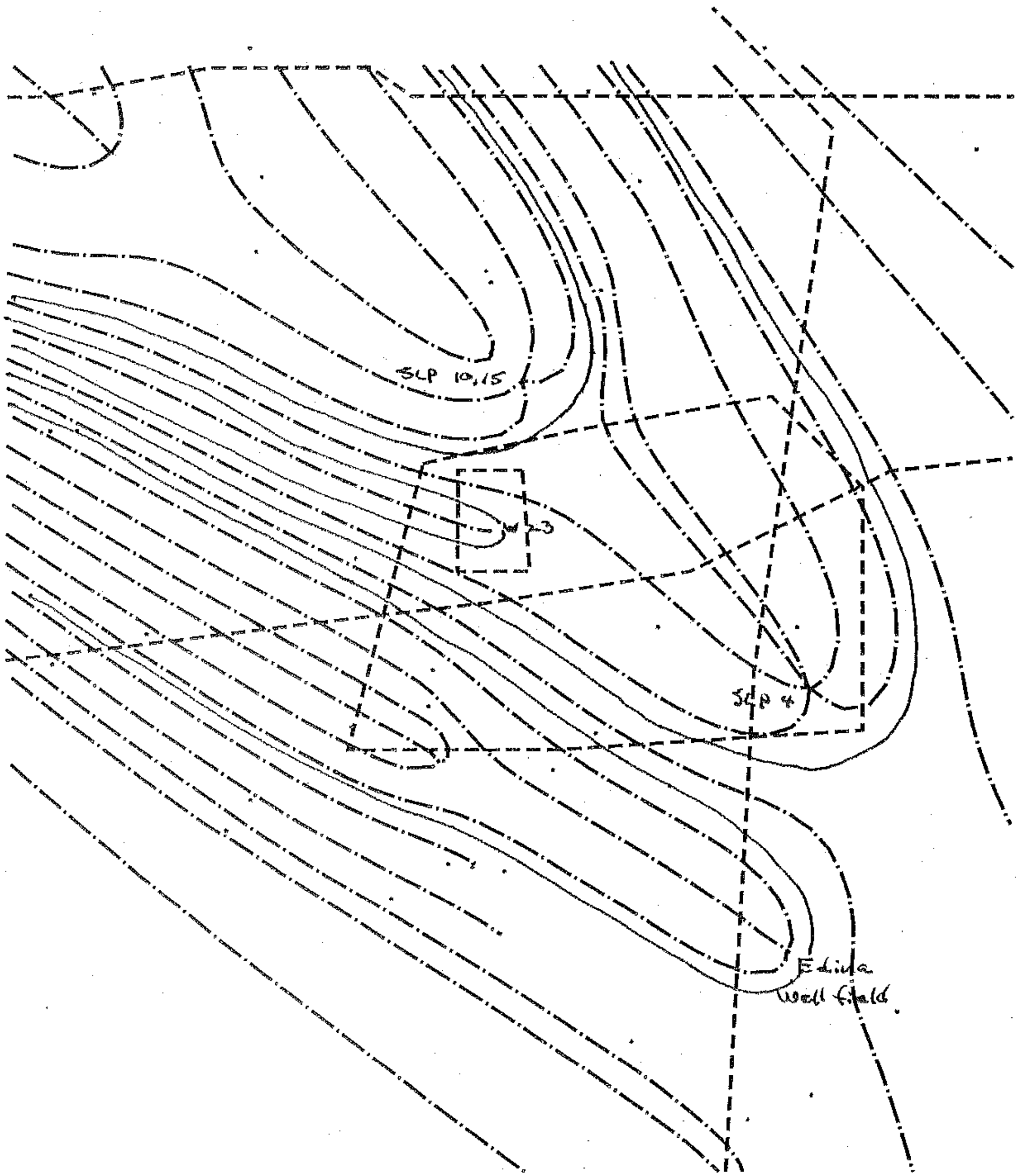
Figure 2



Spring 1992 Pump Rates

SLP4	900	gpm
SLP6	0	"
W48	0	"

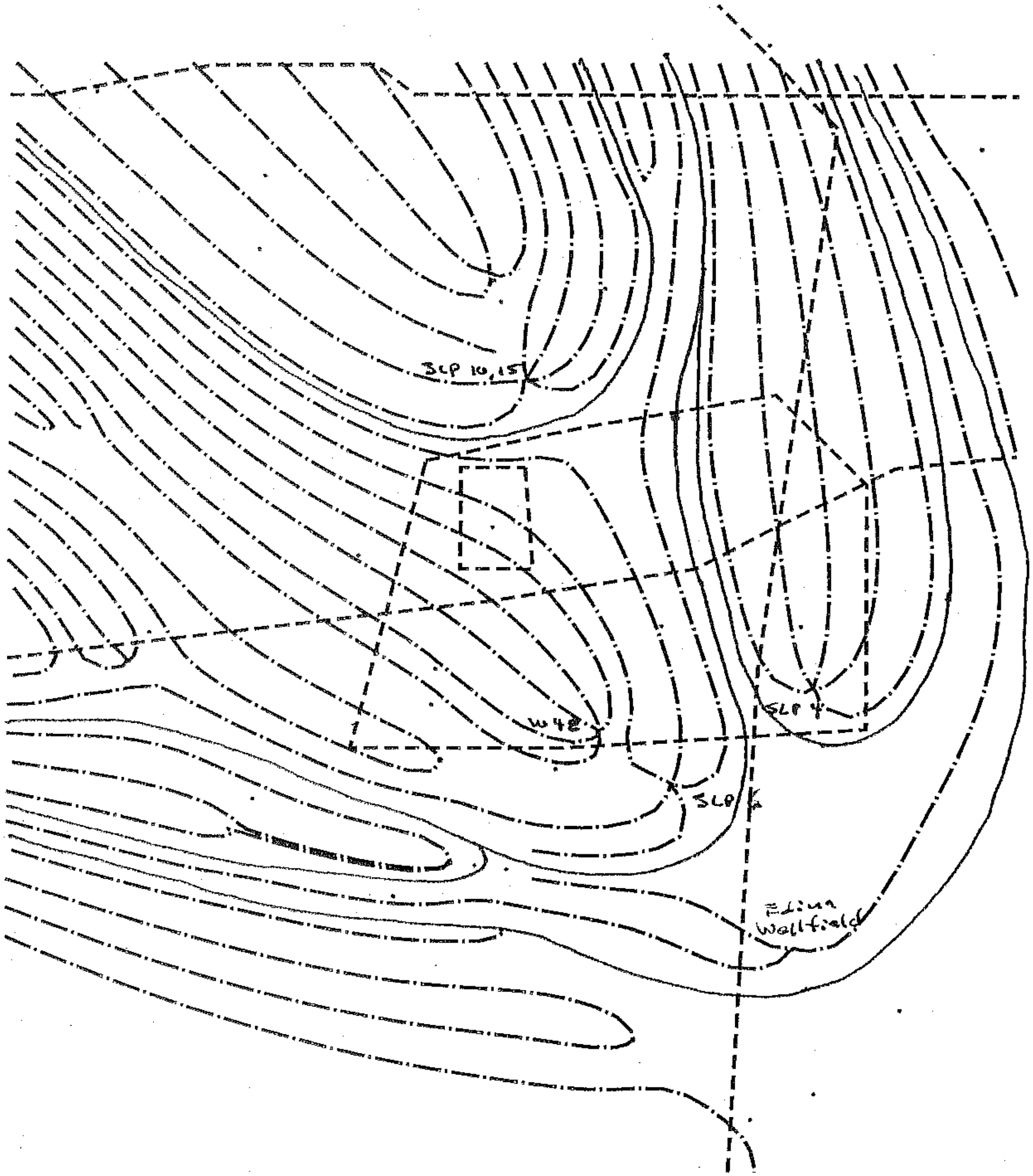
Figure 3



Spring 1992 pumping rates

SLP 4   1200 gpm
SLP 6   0
W48   0

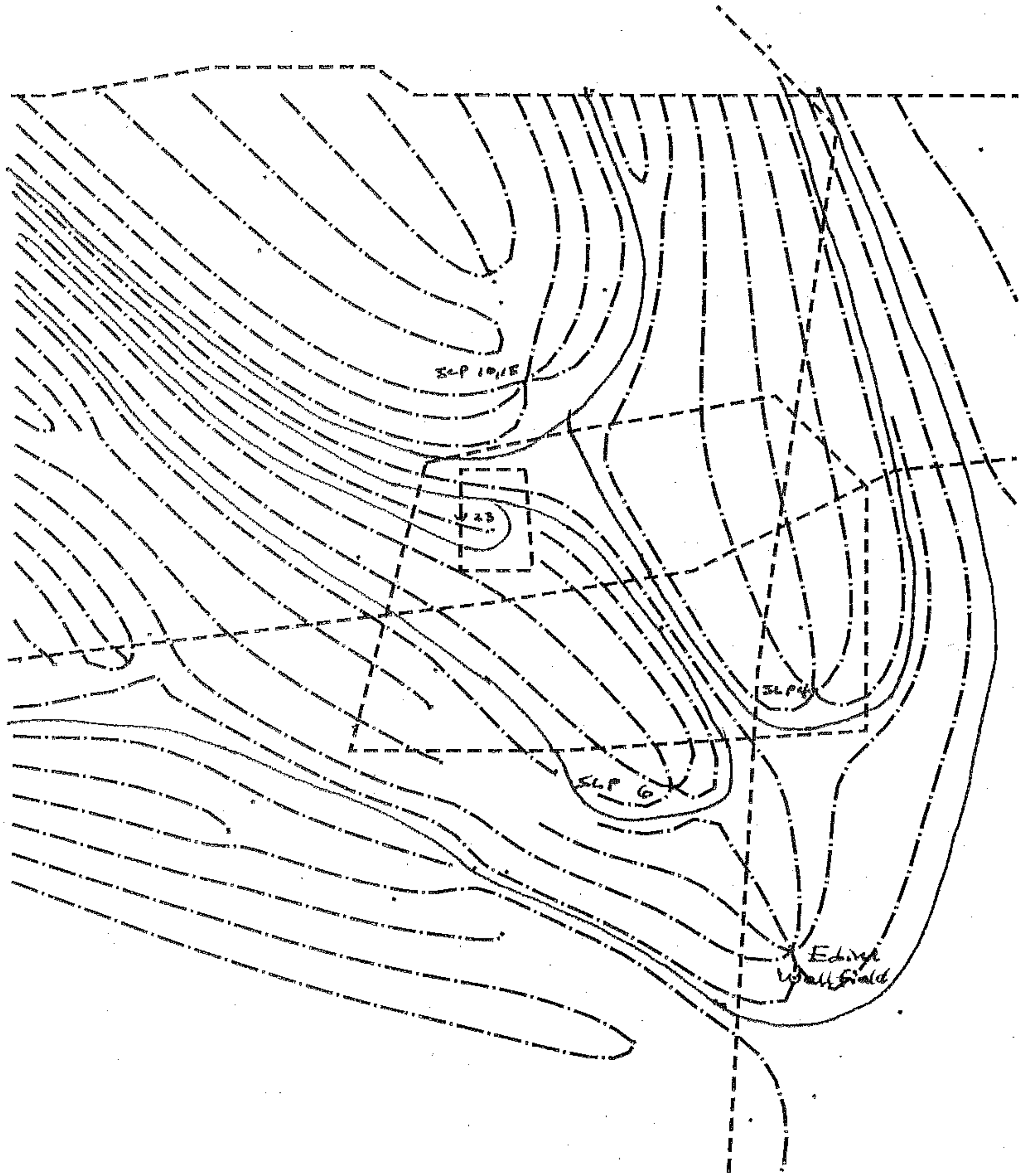
Figure 4



Summer 1992
pumping rates

SLP 4 700 gpm
SLP 6 690 gpm
W 48 785 gpm

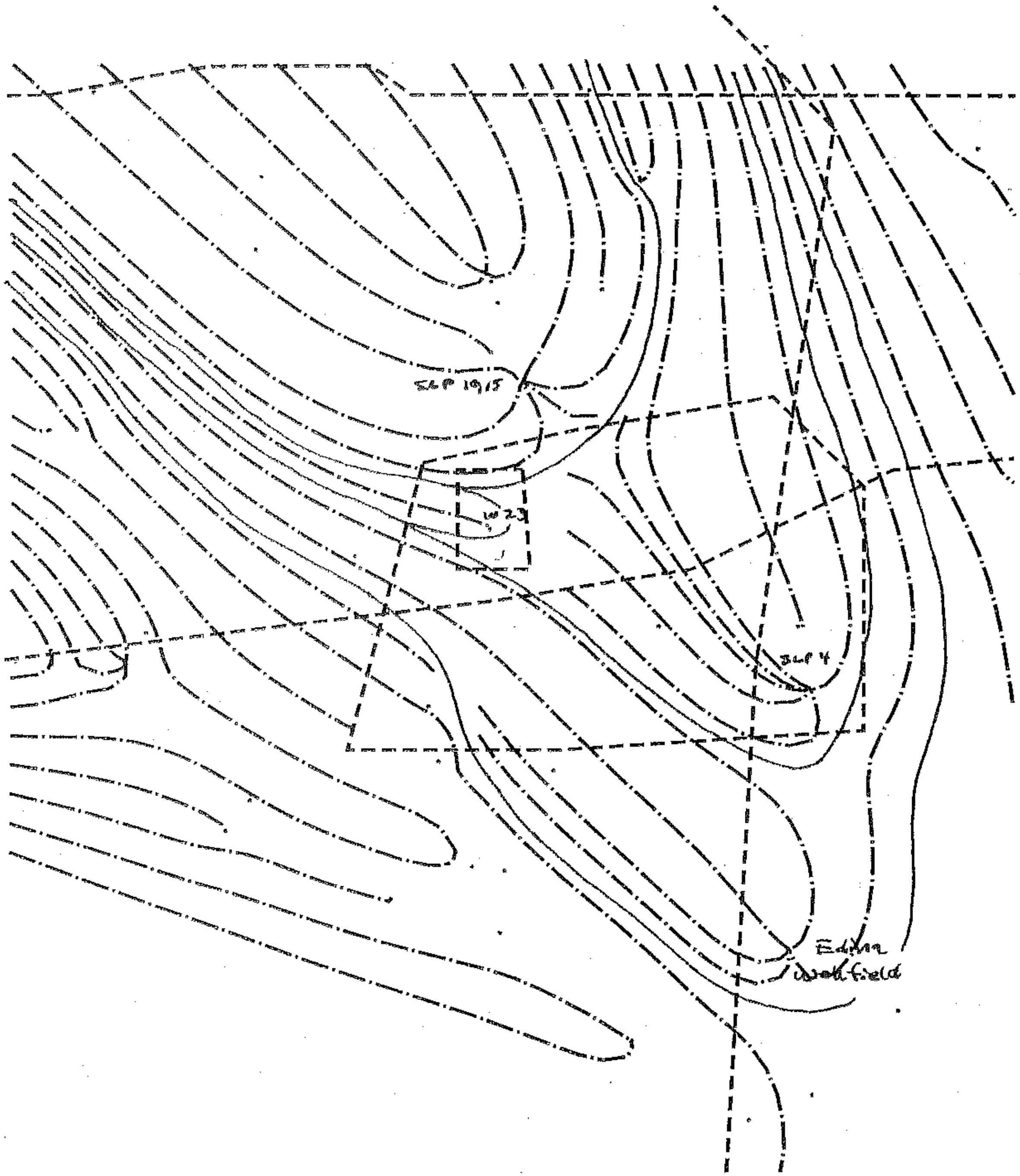
Figure 5



Summer 1992 Pump Rates

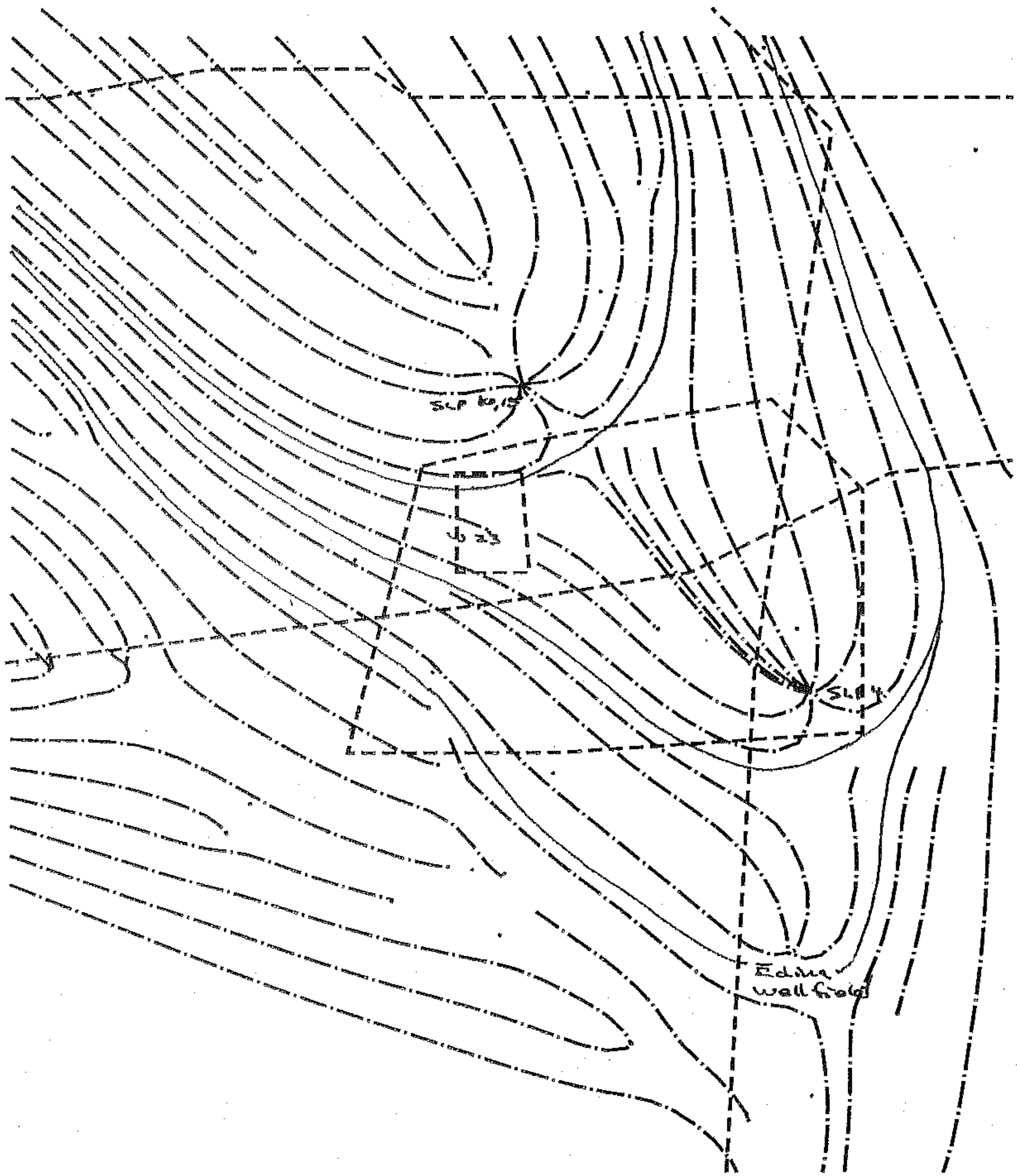
SLP 4	900 gpm
SLP 6	670 gpm
W48	0 gpm

Figure 6



Summer	1992	Pump Rates
SEP 4	900	gpm
SEP 6	0	gpm
W48	0	"

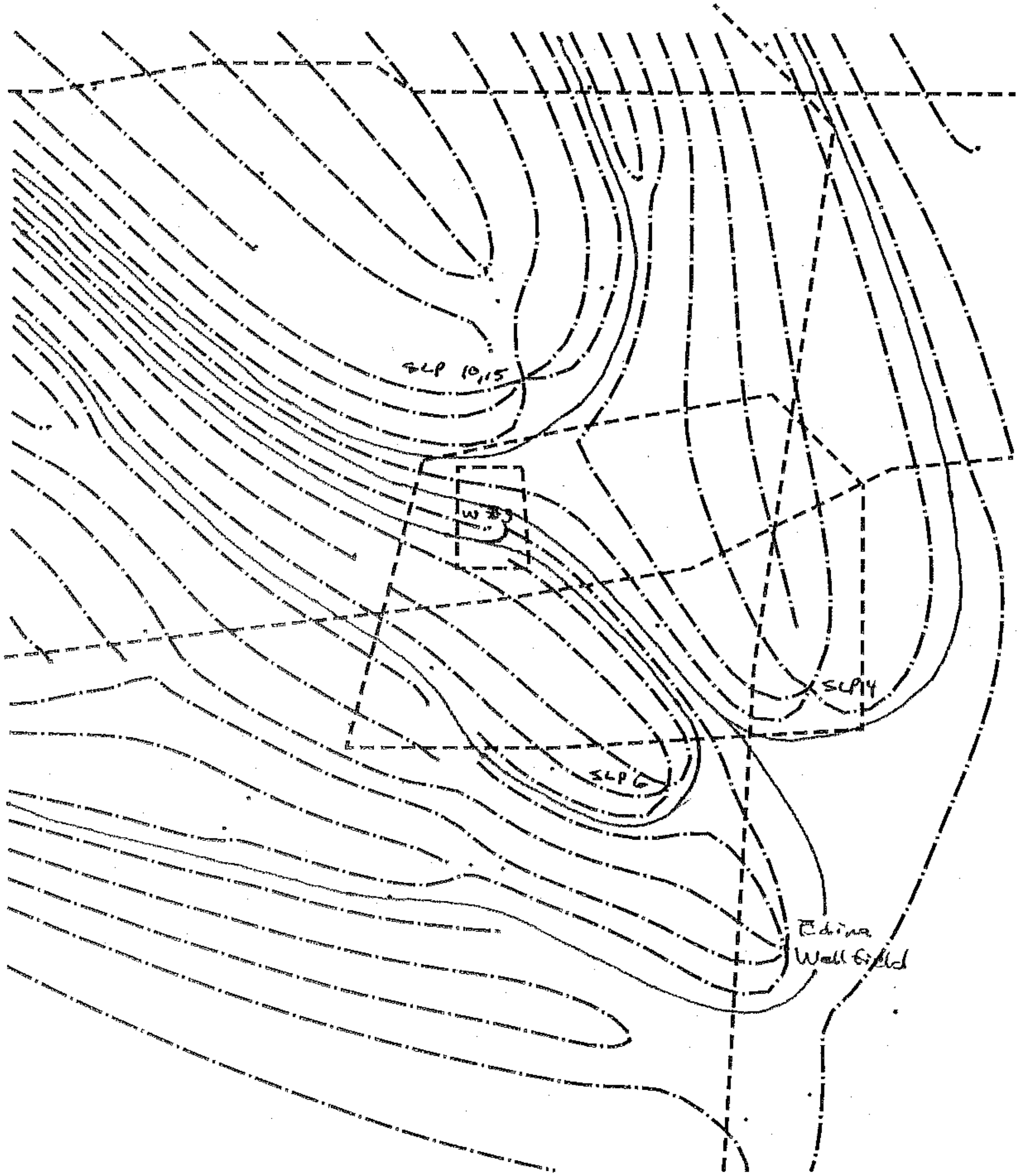
Figure 7



Summer 1992 Pump Rates

SLP 4	1200	gpm
SLP 6	0	"
W 48	0	"

Figure 8



Summer 1992 Pump Rates

SLP 4	1200	gpm
SLP 6	690	"
W 48	0	"